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38. *On a* HUMAN SKULL *and* LIMB-BONES *found in the* PALÆOLITHIC TERRACE-GRAVEL *at* GALLEY HILL, KENT.

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(Read May 22nd, 1895.)

[PLATE XVI.]

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I. INTRODUCTION.

AT a time when so much attention is being directed to the implements made by Palæolithic Man, the discovery of a human skeleton in the Palæolithic gravels of this country cannot but awaken much interest. The remains which form the subject of the present communication have been submitted to me for description by Mr. Robert Elliott, of Camberwell, whose enthusiasm as a collector of flint-implements and other antiquities is well known to many of us, as is also the fine collection of these relics which he has with much labour brought together. It was in the year 1888, on one of his journeys in search of 'implements,' that Mr. Elliott discovered parts of a human skeleton in the gravel yielding Palæolithic implements, which, at a height of about 90 feet above the Thames, overlies the Chalk at Galley Hill, Northfleet. The particulars of this discovery are given in a letter from Mr. Elliott, which will be found at p. 518. The interest of the discovery has seemed to me sufficient to justify a full account of it being placed on record, so that all attendant circumstances may be known, and everyone interested in the matter placed in a position to draw his own conclusions as to the age of these human remains.

II. DESCRIPTION OF THE REMAINS.

The portions of the skeleton which have been recovered are: a large part of the skull, wanting the facial bones; the right half of the lower jaw still retaining the grinding teeth; both femora and parts of both tibiæ; a clavicle, wanting the extremities; the shaft of a humerus; fragments of the pelvis and sacrum, as well as some pieces of ribs. All the bones are much decayed and denuded, while their outer surfaces are marked all over by vermiform depressions, such as are generally thought to be the

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result of close contact with the rootlets of growing plants. When first exhumed, the bones were exceedingly soft and fragile, and, in spite of the care with which they were handled, were all much broken in the process of extraction from the matrix; it was necessary, therefore, to treat them with gelatine and allow them to dry and harden before they could be joined together and rendered fit for study. The presence of the last true molar, or wisdom tooth, with the crown somewhat worn, shows that the skeleton belonged to a fully-grown adult, though probably not an aged individual.

The Skull (Pl. XVI.)—The calvarium was fortunately less broken than the long bones; it is evident, however, that in drying it has become twisted somewhat; but its general characters are clearly shown. The base and facial portions of this skull are wanting, as well as much of the left side; the right side, however, is more perfect, the outer part of the orbit, with the maxilla and jugal bones, being all that is really absent. A portion of the foramen magnum is preserved, with sufficient of the supraoccipital bone to show the form of the under and back parts of the brain-case.

The most striking features of this skull are its extreme length (205 millim.[1]) in proportion to its width (about 130 millim.?), the complete obliteration of the coronal, sagittal, and lambdoidal sutures, both internally and externally, and the prominence of the supraciliary ridges. The extreme narrowness of the cranium is best seen when viewed from above; but this peculiarity is somewhat exaggerated by the distortion which the skull has undergone, the right temporal bone, and the parts posterior to it, being pushed over towards the left side; and besides this, parts of the left side are wanting. The greatest width of the skull is low down, near the mastoid region, but its imperfections prevent the exact width from being measured.

The walls of the cranium are in most parts very thick, the middle of each frontal measuring as much as 12 millim. The supraciliary ridges are very strongly developed, especially at their inner part, although now in a denuded condition; probably they were never so prominent as in the famous Neanderthal calvaria. The frontals are fairly full, and the forehead therefore only moderately receding. The highest point of the skull is in the fore part of the parietal region. The temporal ridge is not strongly marked, but extends abnormally high up on the side of the skull. The right parietal is somewhat inflated at its anterior and lower part, and this inflation is continued on to the adjoining lower part of the frontal, causing a prominent stephanic region. Towards its hinder part likewise the parietal is prominent. The occipital bone forms a well-marked boss or probole at the back of the skull, its upper part being directed well forward as well as upward, and this portion, together with the median and hinder ends of the parietals, forms a distinctly flattened area.

[1] Dr. Garson has kindly gone over the measurements with me, and where, through imperfection of the specimen, we differed to the extent of a few millimetres in our estimate, the intermediate measurement has been adopted.

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TABLE I.—MEASUREMENTS OF VARIOUS HUMAN SKULLS IN MILLIMETRES.

	CIRCUMFERENCE.		LENGTH.		BREADTH.		BREADTH-INDEX.		HEIGHT.		HEIGHT-INDEX.	
		AVERAGE.		AVERAGE.		AVERAGE.		AVERAGE.		AVERAGE.		AVERAGE.
Galley Hill	540	...	203[1]	...	130(?)	...	64(?)	...	137(?)	...	674(?)	
Spy, *ex Fraipont*	580-590	...	200	...	140-150	...	70-74					
Neanderthal, *ex Fraipont* ...	571	...	200	...	144	...	72-74					
Long Barrows, *ex Thurnam* .	495-556	541	180-207	196	130-147	140	63-77	715	124-155	142	680-780	730
Caves, Perthi Chwareu, *ex Busk & Dawkins*	470-597	508	170-192	179	127-147	140	74-80	765	137-147	142	710-846	784
Basque, *ex Thurnam*	482-548	523	165-195	184	125-150	140	71-83	760	122-145	137	69-80	740
Borris, Ireland, *ex Huxley* ...	.....	...	203	...	150	...	737	...	137	...	680	
Engis, *ex Dawkins*	521	...	196	...	137	...	70					
Cro-Magnon, *ex Reliq. Aquit.*	557	...	200-203	...	152	...	748	...	140	...	700	
Round Barrows, *ex Thurnam.*	491-553	536	165-201	184	137-165	150	74-89	810	127-158	142	68-83	770
Trou de Frontal, *Dawkins* ...	547	...	175	...	142	...	811	...	...	...	704	
Eskimo, *ex Flower*	481-558	...	169-201	...	125-145	...	661-787	722	125-147	...	692-793	737
Australian, *ex Flower*	472-547	...	167-198	...	120-145	...	680-772	710	118-143	...	635-826	715
Fijian, *ex Flower*	486-550	...	175-203	...	117-134	...	619-714	663	132-147	...	724-785	741
Negro, *ex Flower*	466-545	...	166-192	...	122-150	...	643-811	733	124-145	...	670-801	738
Melanesian, *ex Thomas*	527	...	202	...	125	...	619	...	131	...	649	

[1] This measurement is taken from the ophrion, so as to correspond with others given in the table.

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The circumference of the cranium is 540 millim., and its length, measured from the ophrion to the farthest point of the occipital prominence, is 8 inches or 203 millim. The breadth cannot be certainly measured, as the left side is wanting in the lower parietal region, where, as the right side shows, the greatest width of the skull is situated. After several attempts to take this measurement, and making due allowance for missing parts, Dr. Garson and I came to the conclusion that the breadth could not have been more than 132 millim., and was probably not less than 128 millim. (medium 130 ?); the breadth-index is, therefore, as nearly as can be measured 64 (?), the skull being extremely dolichocephalic, as indeed is obvious from a general inspection. It may be thought that the skull has undergone lateral compression; but, if this were so, an extension would have taken place in the direction of its height, and this is found not to be the case. The basion being absent, the exact height cannot be measured, but as the hinder margin of the foramen magnum is preserved, this has been taken as a fixed point; and by comparing, in other skulls, the relation between the bregmatic height and the height above the hinder margin of the foramen, a proportion between these two measurements has been obtained, which, being used in the present instance, gives approximatively a height of about 137 millim. for this Galley Hill skull, and consequently a height-index of about ·674. The frontals are narrow immediately behind the maxillary process, and could not have measured much more than 100 millim. when perfect.

Lower Jaw.—The right half of the mandible is preserved, but not in a very perfect condition; the angle and articular process are wanting, having apparently been dissolved. The entire surface of the bone is also much denuded, and so much of the ascending ramus as is preserved is very thin. Even the fangs of the teeth have been partially dissolved, the enamel now standing out prominently from the necks, especially on the inner aspect. The chin is still moderately prominent, although its extremity has been broken away. The alveoli for the incisors are broken down, and the deepest part of the ramus in its present condition is below the interval between the two premolar teeth, where it measures 31 millim. Below the hindermost molar the depth of the ramus is 25 millim. Just below the hinder premolar there is a large vascular foramen about 10 millim. from the lower margin.

The symphysial portion of the jaw is preserved, but the incisors and canines are wanting. On each side of the symphysis the alveolar border is broken; but while portions of the alveoli for the two outer incisors are preserved, there are no traces of the alveoli for the two median incisors, which must have been either very short or else lost during life, and the alveoli filled up by bone.

The alveolus for the right canine is larger than that for the first premolar, and its extreme depth from the inner margin is 14 millim.

The first premolar has a higher crown than the second, but is otherwise a little smaller. The first true molar is just a trifle larger than the second, as will be seen by reference to the table of measure-

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ments below, and the third true molar is as large as the first. The upper surfaces of all the teeth, molars and premolars, are much worn by attrition, presenting a nearly flat surface (Pl. XVI. fig. 2); and in each tooth the enamel has been worn through so as to expose in each premolar one area of dentine, in the first true molar four rather large areas, in the second four smaller ones, and in the third or last molar two, perhaps three, such areas. The enamel of the crowns seems to be very thick, but this is due in some measure to the condition of wearing.

TABLE II.—COMPARATIVE MEASUREMENTS OF GALLEY HILL AND OTHER REMAINS IN MILLIMETRES.

	GALLEY HILL.	SPY.	ESKIMO.	FIJIAN.
Teeth:				
Front molar tooth, width from before backwards	11·5	10 to 11·5	11·5	12·5
Front molar tooth, thickness from side to side	10·8	10·5 to 11·5	11	11·5
Second molar, width	11	10 to 11	10·5	12·3
" " thickness	10·5	10 to 11	10·5	11·5
Third molar, width	11·5	11 to 12	12	12·5
" " thickness	10·8	11 to 12	11	11
Femur, length	421	420		
" diameter, antero-post.	25?	29		
" circumference	90?	90		
Tibia, length	?	320		
" circumference	85	90		
" mid. longitudinal diam.	32·5	33	31·2	
" " transverse diam.	24	24	24	

The femora are both preserved, but are much damaged; that of the left side is the more perfect (Pl. XVI. figs. 6 & 7), although its greater trochanter and part of the head are broken away; the shaft is so much denuded, especially in the middle, that its diameter cannot be accurately measured: it seems to have been about 30 millim. from side to side and 25 from back to front, excluding the linea aspera. The distal articular condyles are denuded externally and internally, so that their width is uncertain; their antero-posterior extent is found to be 62 millim. The greatest length of the femur is about 16½ inches (419 millim.). The shaft is nearly straight, being only slightly convex forwards. The articular head is comparatively large, its vertical diameter being 48·5 millim. The shaft and neck of the bone are rather flattened from before backwards; but the long axes of these two portions seem to be at the usual angle with each other. The upper part of the shaft, however, is twisted upon itself, so that the neck and head are turned more forward than usual; the exact amount of this torsion cannot be measured, on account of the imperfection of the distal

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condyles. The lesser trochanter is moderately developed, and there is a strong linea aspera. The distal condyles could not have been unusually large, and certainly did not project abnormally either forwards or backwards.

Parts of both tibiæ are preserved; they are neither of them in a condition to give any idea of their length, although enough of the shaft of the right one is preserved to show that it was small and has no tendency to platycnemism (Pl. XVI. fig. 8). At about 40 millim. below the nutritive foramen its antero-posterior diameter is about 31 millim. and its transverse diameter 24 millim. The hinder surface of the shaft is fairly rounded, and does not project to any unusual distance behind the level of the interosseous ridge: the proportion being in front of this level 22 millim., behind it 9 millim. (=244 to 1000). The interosseous or fibular ridge is well marked, and there is a broad longitudinal depression in front of it. The anterior edge of the bone is sharp.

The shaft of the right humerus is preserved, and is remarkable for the flattening of its inner surface, as well as for the extraordinary development of its anterior oblique ridges; these striking characters, however, may be fairly matched among the series of humeri preserved in the Museum of the Royal College of Surgeons. It is evident that the corresponding muscles were well developed.

There is a stout clavicle, which calls for no special remark, except that the ridges and rugosities are strongly marked.

The fragments of the pelvis and sacrum are too small to exhibit any useful diagnostic characters.

III. The Galley Hill Skeleton compared with other Races.

1. British Fossil Human Remains.

Human bones have frequently been found in British caves; they are, however, with few exceptions, of Neolithic age or of more recent date; and the few that have been met with under circumstances indicating a possibility of Palæolithic age are too fragmentary to supply any satisfactory information as to the physical characters of the skeletons to which they have belonged. The fibula from the Victoria Cave at Settle, Yorkshire,[1] is not human. Prof. W. Boyd Dawkins[2] speaks of a human tooth from the cave at Plas Newydd as 'the only piece of the human frame of late Pleistocene age found in Great Britain.' The portion of a cranium discovered by Mr. Henry Prigg[3] in brick-earth at Westley, Suffolk, and figured by Mr. Worthington Smith,[4] was too small a fragment to give any idea of the form of the cranium of which it was a part. The humerus from Kent's Cavern, determined by the late W. Davies,

[1] Busk, Journ. Anthr. Inst. vol. iii. (1874) p. 392.
[2] 'Early Man in Britain,' pp. 192 & 225.
[3] Journ. Anthr. Inst. vol. xiv. (1885) p. 51.
[4] 'Man the Primæval Savage,' 8vo. London, 1894, p. 281.

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and preserved in the British Museum (Natural History), is not certainly of Palæolithic age. The human remains which have the best claim to a Palæolithic origin have been found on the continent of Europe, and will be noticed farther on.

The Neolithic remains of this country have been studied by many competent workers. Dr. Thurnam,[1] in his elaborate papers on the 'Two Principal Forms of Ancient British and Gaulish Skulls,' refers all the primary interments of the Long Barrows to the Neolithic period. The skulls of this race are said to be long, oval, or dolichocephalic, having a breadth-index varying from ·65 to ·75; the sutures have a tendency to become obliterated. The supraciliary ridges are not strongly marked, and none of the features have an extreme development. The face is orthognathic, and the upper and lower jaws are comparatively small. The average height of these Long Barrow people, as deduced from their femora, is about 5 feet 5·4 inches. Many of the tibiæ are platycnemic.

The skeletons of the Round Barrows are referred by Dr. Thurnam to the Bronze period; they have short or brachycephalic skulls, with a breadth-index varying from ·74 to ·89; the supraciliary ridges are large, the jaws are big and prognathic; indeed all the features were strongly marked, and the average height was about 5 feet 8·4 inches. These deductions, made by Dr. Thurnam, seem to have been confirmed by subsequent writers.

To the Neolithic race Prof. Boyd Dawkins[2] refers the skeletons from Perthi Chwareu, which were described by Prof. Busk.[3] The breadth-index of these skulls is much higher than in the Long Barrow types, ranging from ·72 to ·78; but seeing that in all other respects both the skulls and limb-bones are said to agree with the Neolithic forms, as described by Dr. Thurnam, they are believed to belong to the same race.

The Galley Hill skull resembles the Long Barrow forms in being dolichocephalic, and its closest agreement is with the longest skulls of the race. The synostosis of the sutures is another point of resemblance, as is also the comparatively small size of the jaw and the projection of the chin, in which particulars our present specimen differs so markedly from the heavy jaw and receding chin of the Spy skeleton, to be presently noticed. The low stature of the entire skeleton (5 feet 1 inch), as deduced from the size of the femur, is also in agreement with the Long Barrow forms, but in this particular there is an equally close resemblance to the Spy race. The uniform size of the three molar teeth and the manner in which the crowns are worn to a level surface are peculiarities found in some at least of the Long Barrow men. On the other hand, the strong development of the supraciliary ridges, and probably the prognathic features, are very important characters, in which the Galley Hill skull differs markedly from the Neolithic race.

[1] Mem. Anthrop. Soc. vols. i., ii., iii. (1865–70).
[2] 'Cave Hunting,' London, 1874, p. 197.
[3] Journ. Ethn. Soc. 1871, reprinted in Boyd Dawkins's 'Cave Hunting,' p. 166.

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The skulls from Perthi Chwareu above mentioned, as described by Prof. Busk, are less like the Galley Hill skull, inasmuch as their breadth-index (·72–·78) places them quite at the opposite extreme of the Neolithic race and brings them into nearer relation with the Round Barrow people, in which the breadth-index is from ·74–·89. Moreover, the Perthi Chwareu skulls do not show any tendency to synostosis of the sagittal suture.

The skull from the river-gravel at Tilbury, described by Sir Richard Owen,[1] whatever may be its age,[2] is unlike the Galley Hill cranium in both upper and side views; its exceedingly heavy brows approach those of the Neanderthal skull, but the forehead is fuller and more prominent.

Among the skulls referred to by Prof. Huxley in the 'Prehistoric Remains from Caithness,'[3] that from the bed of the river Nore at Borris, Ireland, presents many points of resemblance to the Galley Hill specimen:—'The supraciliary ridges are prominent, the forehead retreating, the probole large, and the superior curved line and occipital spine well marked'; besides this, the skull is much depressed, and when seen from behind has flattened and nearly vertical side-walls. The breadth-index is ·737 and the height-index ·68. Although the Borris skull is broader than that from Galley Hill, yet in other respects it makes a near approach to the latter.

2. Continental Fossil Human Remains.

Within the last ten years two remarkable human skeletons have been discovered in a cave at Spy, near Goyet, Namur, Belgium. They were found in such relation with remains of extinct mammals (*Elephas primigenius* and *Rhinoceros tichorhinus*) and flint-implements as to leave little room for doubt that they are of Palæolithic age. These human remains form the subject of an elaborate memoir by MM. Julien Fraipont and Max Lohest:[4] the skulls and other bones being described in minute detail and compared with the Neanderthal and other fossil human remains, which are believed by the authors to belong to the same Palæolithic race.

The two skulls from Spy are remarkable for the great development of the supraciliary ridges and for their receding foreheads; the latter character being especially marked in one of them, which in consequence agrees very closely with the famous Neanderthal calvaria. Seen from above, these two skulls further agree with that from the Neanderthal in being narrow behind the orbits; but they have broad and inflated parietals. Their breadth-indices are in one case ·70,

[1] 'Antiquity of Man as deduced from the Discovery of a Human Skeleton, etc.,' 8vo. London, 1884.

[2] Holmes, T. V., 'Notes on the Geological Position of the Human Skeleton lately found at the Tilbury Docks, Essex,' Trans. Essex Field-Club, vol. iv. (1885) p. 135.

[3] By Samuel Laing, with Notes on the Human Remains by Thomas H. Huxley, 8vo. London, 1866.

[4] 'La Race Humaine de Neanderthal, etc.,' Archiv. d. Biologie, vol. vii. (1887) p. 587.

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and in the other about ·74 : that of the Neanderthal skull being about ·73. The occipital region in both specimens projects considerably, and in this particular they are not unlike the Long Barrow (Neolithic) skulls.

The Galley Hill skull resembles those from Spy in the possession of prominent supraciliary ridges and a projecting occipital bone; but its frontal region is fuller and more nearly of the normal type. When seen from above it is more parallel-sided and presents none of the inflation of the parietal region which is so marked in both the Spy and Neanderthal skulls; and it is this which results in the much lower breadth-index (·64 ?) of the Galley Hill cranium. Although this skull is somewhat narrower behind the orbits (100 millim.) than either of the Spy skulls (104–106 millim.), yet it has nothing like the same lateral projection of the orbits.

The lower jaw from Spy is remarkable for the depth of the horizontal ramus and for its vertical, or slightly receding, chin. The lower jaw from Galley Hill is comparatively small and has a projecting chin. In both specimens the teeth are worn to a nearly level surface, and the measurements of the three molar teeth are very nearly the same. The hindermost true molar of the Galley Hill jaw seems to have been as large as the first true molar; in the Spy specimen the corresponding last molar is one millimetre wider and thicker than either molar 1 or molar 2.

The femur of the Spy man, as described and figured, is robust and thick, with large articular extremities; the shaft is much curved forward, round in section, and has only a slightly prominent linea aspera. The neck forms a less obtuse angle with the shaft than is usually the case, and is twisted more forwards. The distal condyles extend abnormally forwards and backwards, and the inner one is so much longer than the outer as to indicate an unusual obliquity of the entire bone. The length of the Galley Hill femur is about the same as that of the Spy specimen, and its large proximal articular head is very similar, but in all other particulars it will be seen that the two bones are very different.

The Spy tibia is short and robust. The transverse section of the shaft is ovoid, and the angles are rounded; the hinder surface is particularly convex, and the interosseous ridge is placed far forwards. The transverse section of the Galley Hill tibia presents quite a different outline, for although the long and short diameters are very nearly the same in the two specimens, yet in this the interosseous ridge is farther back, the angles are sharp, and the hinder surface is flatter than in the Spy tibia.

The human skeletons from the cave of Cro-Magnon [1] belonged to a tall race, one skeleton indicating a man 5 feet 11 inches in height. The skull of this individual is dolichocephalic, with a breadth-index of ·73. The femur is strongly carinate, and the tibia excessively platycnemic. All these characters are unlike those presented by the Galley Hill skeleton.

[1] 'Reliquiæ Aquitanicæ,' p. 66; Boyd Dawkins, 'Cave Hunting,' p. 249.

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The large skeletons from the Mentone Caves are said by M. E. Rivière [1] to possess the greater part of the characters of the Cro-Magnon race.

The Engis skull, originally described by Schmerling, was afterwards noticed and figured by Prof. Busk [2] and then by Sir C. Lyell [3] and Prof. Huxley.[4] It is described as dolichocephalic, with a breadth-index of ·70, and in this respect seems to approach the Galley Hill skull, but the two figures given by Prof. Busk do not at all resemble our specimen.

The dolichocephalic skulls of the primitive Basques, which were described by M. Broca,[5] were afterwards shown by Dr. Thurnam [6] to be very similar to those from the Long Barrows, and he believed them to belong to the same early race of men, the Neolithic. Prof. Boyd Dawkins holds the same opinion, the skulls from Perthi Chwareu being particularly like these ancient Basques. An examination of the skulls of this race preserved in the Museum of the Royal College of Surgeons shows that they are inflated in the parietal region, and in none of them does the breadth- or height-index fall so low as in the Galley Hill cranium.

3. Living Races of Men.

Among the races of Man now living there are several possessing dolichocephalic skulls, which it will be well to notice. The measurements and other particulars alluded to below are for the most part derived from Sir William Flower's [7] descriptions, but a number of the specimens in the Museum of the Royal College of Surgeons have also been compared, and for this privilege I am indebted to the kindness of the present curator, Prof. Charles Stewart.

The skulls of the Eskimo are long (169–201 millim.) and narrow (125–145 millim.), but none are so laterally flattened in the parietal region as the Galley Hill cranium, and there is an entire absence in them of the thickened supraciliary ridges; moreover, the characteristic flat face, caused by the forward projection of the cheek-bones and outer margins of the orbits, is unlike the Galley Hill skull, so far as one can judge from the broken portions of the orbit which are preserved. The measurements of the last-named specimen nearly all fall within the extreme dimensions of the Eskimo, in which race, however, the breadth-index varies from ·66 to ·78 and the height-index from ·69 to ·79.

The teeth in one Eskimo skull are as nearly as possible like those preserved in the Galley Hill specimen; but in another example the hindermost lower molar is smaller than the others. The Eskimo femur is very similar to that from Galley Hill, being flattened from

[1] Comptes Rendus Acad. Sci. Paris, vol. cxiv. (1892) p. 567.
[2] Nat. Hist. Rev. vol. i. (1861) p. 155.
[3] 'Antiquity of Man,' 1863, p. 79.
[4] *Ibid.* p. 80.
[5] Bull. Soc. Anthrop. Paris, vol. iii. (1862) p. 579.
[6] Mem. Anthrop. Soc. vol. i. (1863) p. 120, & vol. iii. (1867) p. 41.
[7] Catal. Mus. Roy. Coll. Surg. part i. 1879.

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before backwards and possessing a large articular head; it differs, however, in having a stronger linea aspera and in the larger size of the lesser trochanter. The forms of the tibiæ, as shown by their transverse sections, are also much alike in the two skeletons: the measurements of their longer and shorter diameters being almost identical. The height of the skeleton, No. 834, in the Royal College of Surgeons is, as nearly as possible, the same as that calculated for the Galley Hill man; the femora only differing by at most 3 or 4 millimetres.

Negro skulls are long and narrow (breadth-index ·64–·81), but their height is proportionately greater, the index, seemingly, never falling so low as it appears to be in the Galley Hill specimen. There is little or no development of brow-ridges; the forehead is fairly prominent, and the interorbital width is greater than it seems to have been in the Galley Hill skull. There is some variation in the size and proportions of the negro's molar teeth; in some, the last lower molar is as large as the two which precede it, but in other cases it is decidedly smaller. The tibiæ are more slender and more platycnemic than in the Galley Hill skeleton.

None of the Australian skulls in the Royal College of Surgeons have so low a breadth-index (·68–·77) as the Galley Hill skull, but the height-index may fall lower (·63–·82). In the possession of thickened brow-ridges and receding foreheads, there is a resemblance to our specimen. The teeth vary much in size and proportions; all the molars are sometimes very large, and the hindermost may be larger than those in front of it, or it may be markedly smaller. The tibiæ are not platycnemic, but very similar to those of the Eskimo and Galley Hill skeletons.

The Fijians exhibit as extreme a condition of dolichocephalism as any known race, their cephalic index falling in some cases as low as ·619, while it is not known to rise higher than ·714; the height-index, however, is proportionately greater, ranging from ·72 to ·78. The lateral flattening of the parietal region in the Fijian crania makes a nearer approach to that of the Galley Hill man than any other form, excepting perhaps the Melanesian to be presently noticed. The Fijians have strongly developed supraciliary ridges, as large possibly as in the Galley Hill skull; but the forehead is fuller and more prominent, while the probole is less projecting. The lower molars of the specimen measured (1127, Roy. Coll. Surg.) are more nearly equal in size than in any other instance I have seen (see Table II., p. 509).

The remarkable Melanesian skull described by Mr. Oldfield Thomas[1] is much narrower than that from Galley Hill, its breadth-index being only ·619, and seen from above the outlines of the two skulls are very similar. In both the supraciliary ridges are very strongly developed, but the forehead is somewhat fuller in the Melanesian than in the Galley Hill skull; also in the latter the probole is more prominent and the occiput more flattened below. In a side-view,

[1] Journ. Anthrop. Inst. vol. xiv. (1885) pls. xiv. & xv.

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the Galley Hill skull is apparently more depressed than is this Melanesian, but the height-index of the latter (·649) is less than that calculated for the former (·674 ?). This seeming discrepancy may in part be due to the natural flattening below of the occiput in the Galley Hill skull, and in part to a too liberal allowance being made in the endeavour to calculate the probable height without a definite basal point.

4. General Remarks on the possible Affinities of the Galley Hill Remains.

Briefly stated, the more important characters of the Galley Hill skull are its length and narrowness, for it is extremely dolichocephalic, unusually parallel-sided, and much depressed. The small extent, both in height and width, shows that there has been little or no *post-mortem* compression, and only such changes as may be due to shrinkage in drying since it was exhumed. The supraciliary ridges are large, the forehead moderately receding. The temporal ridge extends far up towards the top of the skull. The probole projects far backwards. The underpart of the occiput is much flattened. The last lower molar is as large as either of the two in front of it. All the main sutures are closed and nearly obliterated.

The closure of the sutures at once suggests the possibility of this skull being scaphocephalic as a consequence of this closure ; there is nothing, however, but the shape to support this idea. The individual must have been middle-aged, for not only is the last molar in place, but it is well worn ; and, for all we know, there may have been no premature synostosis, but only such as appears to be commonly met with among the Long Barrow race. In none of the skulls mentioned in this paper is the lateral flattening so marked as in the one here described, and among the ancient skulls hitherto known it is only in the Long Barrow race that the breadth-index falls so low as it does in the Galley Hill skull. So few examples of the Spy race are known that it may well be, when more are discovered, that lower indices will be met with ; but this is hardly likely to be the case with those races of which a good number have been measured. In other particulars the Long Barrow skulls are less like our specimen, for the height-index is never so low, the forehead is better developed, and there is no marked thickening of the supraciliary ridges.

The river-bed skull from Borris, Ireland, noticed by Prof. Huxley, is the one which, in a side-view, comes nearest to that from Galley Hill ; its supraciliary ridges are large, the entire skull is much depressed, the probole is large, and there is a flattening of the underpart of the occiput ; but, although this skull is dolichocephalic, its breadth-index (73·7) is much higher than in the present skull and agrees very nearly with that from the Neanderthal.

The age of the Borris skull is uncertain, but is regarded by Prof. Huxley as representing an extreme form of the most ancient race whose remains have been met with in Ireland, and he identifies

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this race with the Long Barrow type of England and the 'cumbecephalic' inhabitants of Scotland. The Professor also sees a similarity between these, the Scandinavian and the Eskimo types; moreover he agrees with Dr. Thurnam in recognizing a relationship with the ancient Basques. Further than this, he traces in the Australian of the present day the same type, and thinks that the famous Neanderthal cranium is more nearly approached by the Australian skull than by any other.

Attention has already been directed to the similarities between the Galley Hill skull and those of the Eskimo, as well as to its resemblance to those of the several dolichocephalic races of the south. In each of these races, however, there are important differences which prevent our specimen from being referred to any one of them.

If I am well-advised in supposing that the Galley Hill skull may be nearly related to the Borris skull, and this represents, as Prof. Huxley thinks, the most ancient race known in Ireland and an extreme form of the Long Barrow type of England, then the Galley Hill skull would be a still more extreme form of this same race, which is generally regarded as Neolithic. But may it not be that the Borris and Galley Hill skulls really represent a still earlier type of man, differing from the Neolithic race in the stronger development of the supraciliary ridges, in the more receding forehead, and in the flattening of the underpart of the occiput?

It may be objected that we already know the earlier or Palæolithic race, as represented by the Spy and Neanderthal remains; but, although this may be true for the European continent, it may not be so for Great Britain or Ireland. Hitherto we have not known any of the physical characteristics of the race which made the Palæolithic implements found in Britain. It has been supposed by some writers that there is no real break between the Palæolithic and Neolithic races, but that a gradual change in the type of implements may be traced, indicating a gradual development of the race that made them. If this be the case, then it might be that the Neolithic people descended from a Palæolithic race, represented by the Galley Hill and Borris skulls; having in the meantime developed higher crania, a fuller frontal, and rounder occipitals, at the same time losing the strong supraciliary ridges.

Prof. Boyd Dawkins, however, thinks that the Palæolithic is a distinct race from the Neolithic, as their different modes of life and artistic talents seem to indicate, and further believes that the Eskimos are descended from the former race. If this be correct, and if the Galley Hill man represent the Palæolithic race, then the Eskimos have lost the strong supraciliary ridges and developed their characteristically broad and anteriorly directed malar bones.

It must be allowed that the characters presented by the Galley Hill remains are not such as will permit of any very definite conclusions being drawn as to the precise race to which they may have belonged.

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IV. Remarks on the Age of the Gravels in which the Human Remains were found.

It was in the year 1888, and soon after the remains were found, that Mr. Elliott brought the skull for me to see; but as it was his intention to describe the remains himself, they were not left with me, and it was not until last July (1894) that I again saw the specimen. As it was evident that the interest of this discovery would depend upon our knowing the exact circumstances in which the remains were found, I requested Mr. Elliott to put in writing all the facts, so far as he had noted them at the time or could remember, as to the finding of the skeleton, also as to the condition of the bones and of the gravel in which they were found, and the following is his reply:—

'According to my promise, I write to let you know the particulars of my find of human remains in undisturbed gravel, capping the Chalk, at the top of Galley Hill, in Kent, at the end of September, 1888.

'It was my custom to visit the pits at Milton Street, Swanscombe, Galley Hill, and neighbouring excavations every fortnight regularly (in search of flint-implements) for more than two years before the discovery of the human remains—so that I was well acquainted with the pit beforehand.

'In 1888 the chalk-pit itself was considerably smaller than now, and was constantly worked for chalk, used in the Cement Works, the gravels on the top being removed and 'screened' on the spot. Thus the removal of the gravel had to keep pace with the excavations of the chalk beneath, so that several tons were removed daily and carted away.

'It was on one of my fortnightly visits that I was informed by a man, named Jack Allsop (who had for a long time looked out and saved for me any implements or stones of similar shape, obtained while screening the ballast) that he had found a skull under the gravel. This I could hardly credit at first; but on my asking him to show it to me, he produced it in several pieces from the base of a pillar of laminated clay and sand, where he had hidden it. I asked where the rest of the bones were; he pointed to the section opposite this pillar, and a few feet from it, and told me that he had left the other bones undisturbed, for me to see; and there, sure enough, about 2 feet from the top of the Chalk, and 8 feet from the top of the gravel, portions of bone were projecting from a matrix of clayey loam and sand. He also told me that several of the men employed at the works, the master of the neighbouring school, and others, had seen the skull.

'The section of gravel was 10 or 11 feet thick, and extended for a considerable distance along the south and east end of the pit; several pot-holes or pipes running from it, deep into the Chalk.

'I carefully examined the section on either side of the remains, for some distance, drawing the attention of my son Richard, who was with me, and of Jack Allsop, to it. It presented an unbroken face of gravel, stratified horizontally in bands of sand, small shingle, gravel, and lower down beds of clay and clayey loam, with occasional stones in it—and it was in and below this that the remains were found. We carefully looked for any signs of the section being disturbed, but failed: the stratification being unbroken, and much the same as the section in the angle of the pit remaining to this day, but it was then clear and not covered by rubbish as it now is in places, all the 'callow' and loam at the top being at that time removed to allow of the gravel being got at.

'I went on my knees, and, with the point of my geological hammer and a knife, tried to work round each piece of bone, but soon gave up the attempt, as the bones were so friable and fragile that many went to pieces as soon as touched—so that I decided to work about a foot, each way, from the bones.

'Jack Allsop and I went to work, and we were fortunate enough to obtain the fragments which are now in your keeping. So friable were they that we had to place them on soft, newly screened sand to harden in the atmosphere, where I allowed them to remain between 4 and 5 hours, by which time they became a little hardened, and I carefully wrapped them in soft paper and brought them home.

'These bones had been left *in situ* by Jack Allsop, because of their being too soft

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for him to get out, and also in order that I should see them exactly as he found them.

'Within a few days of my obtaining them, you will, I think, remember that I brought the skull to you in pieces, and you kindly offered to piece the remains together for me; but I preferred taking them away, as I then intended to work the subject up, and describe and publish my find. This I have been unable to do, not having the necessary leisure from business, and I regret not having placed them in your hands before.

'The remains have been in my museum ever since, and no one has interfered with them, except myself and a few friends in my presence. So you have them exactly as they were found, except that I have dipped them in a solution to preserve them.

'In May last my friend Mr. Frank Corner, of Poplar, saw these remains and urged me to place them in someone's hands, so that a description of them might be published. In June Mr. Worthington Smith examined the remains, and seemed much impressed with their peculiarities of structure.'

(Signed) ROBERT ELLIOTT,
Camberwell, July 1894.

Mr. Matthew H. Heys, of Greenhithe, who in 1888 was master of the school which stands close to the pit at Galley Hill, appears to have been the first person who saw the skull when it was uncovered by the workmen in excavating the gravel; and in answer to my enquiries, this gentleman, who has paid some attention to geology, in a letter gives me information which not only confirms what Mr. Elliott has already stated, but adds the important fact that he saw the skull *in situ* before it was removed from its ancient resting-place. Mr. Heys's observations as to the undisturbed condition of the gravel are likewise strong evidence in favour of these remains being of the same age as the gravels in which they were found. He writes as follows:—

'In reply to your enquiries concerning the skull found in this immediate neighbourhood, I have to say that my attention was called to the spot by the workman who unearthed it, and before it was removed from its long resting-place. For the moment, I was tempted to appropriate it there and then, but when I examined it more carefully I was struck by the undisturbed condition of the gravel in which it was embedded; it seemed as though gravel and skull were deposited at the same time.

'I had only a few spare moments at the time, for I was called back to my school duties.

'My intention was to obtain some indisputable record of its position in the gravel by photographing it *in situ*, or by the testimony of one or two intelligent people. What was my chagrin, when I visited the spot again, to find that it had been removed! I was so disappointed that I tried to forget and banish it from my mind. Had I realized the value of the find as I now do, I should have mounted guard over it and not allowed its removal till such record as that above mentioned had been obtained.'

(Signed) MATTHEW H. HEYS,
Greenhithe, February, 1895.

Galley Hill, as marked on the Ordnance map, is not quite $\frac{3}{4}$ mile north-west of Northfleet station. North of the high road is a large chalk-pit in which are the cement-works now using the chalk. The spot where the human remains were found is at the south-eastern corner of the pit, near the main road. The Chalk here rises to a height of nearly 90 feet above the Thames, and is capped by gravel, 9 or 10 feet thick, but thinning towards the east and west. Southwards the gravel extends to Swanscombe and Milton Street, from both of which places, as well as at Galley Hill, Mr. Elliott has obtained many Palæolithic implements. The Chalk and overlying

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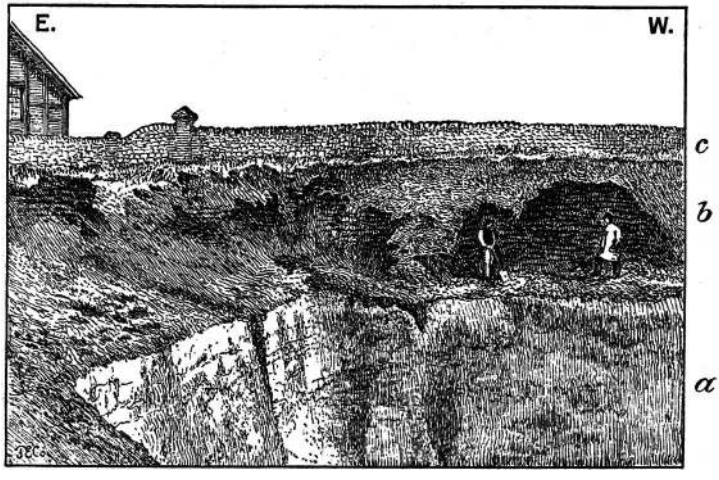
gravel in 1888 had been worked southwards nearly to the high road, so that less alteration has been made since than might have been expected: in fact, the chalk which supported the gravel still remains; but the gravel itself, which contained the bones, has been removed, and the present face of the pit is about 10 feet from the exact spot. This change, although slight, is quite sufficient to prevent that verification of the undisturbed condition of the gravel overlying the skeleton which, under the circumstances, is so desirable—more especially as no experienced geologist saw the spot in 1888, when the discovery was first made.

Fig. 1.—*Chalk and Gravel Pit, Galley Hill, Kent. (S.E. corner of pit, looking S.)*



a=Chalk. *b*=Gravel. *c*=wall, behind which is the high road. The figure on the right is represented as standing on the spot where the human remains were found.

(From photographs by Mr. Clement Reid and Mr. J. W. Reed.)

My lamented colleague, Mr. Topley, after examining the section with us in July 1894, was of opinion that the gravel then standing above the Chalk was in an undisturbed condition, and, judging from its relation to the gravels of the surrounding area, considered it to be part of the high-level terrace-gravel of the Thames Valley. Mr. Clement Reid visited the pit with us in April 1895, when a clean face was made to the gravel, as close as possible to the spot where the bones were found; and the stratification of the beds, in the section thus exposed, convinced him that the gravel was undisturbed.

Mr. Whitaker,[1] in his memoir, alludes to the gravel at Northfleet

[1] Mem. Geol. Surv. 'Geology of London,' 1889, pp. 440, 441.

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and Swanscombe as high terrace-gravel; and that at Galley Hill is continuous with the gravel at the latter locality.

Prof. Prestwich mentions the gravel at Milton Street, which joins that at Swanscombe, as 'the high-level river-drift of the Thames Valley'; and says, 'It contains flint-implements of a distinct and more advanced type than those of Ash and Westyoke [plateau gravels], while at a lower level still are brick-earths and gravel with extinct mammalian remains and implements of a yet later period.'[1]

The flint-implements found in this gravel at Galley Hill (p. 505) are similar to those from the pits at Swanscombe and Milton Street, and are of acknowledged Palæolithic type; most of them are pointed and well worked, some being worked over the whole surface, including the rounded end, while others have part of the base unworked and still showing the natural surface of the flint. Mr. Elliott has obtained several types of implements from this pit; namely, tongue- or spear-shaped forms, ovoid implements, hand hatchets, chipping tools, drills or borers, and flakes of various kinds. Many, if not most, of these implements have the edges sharp and almost unworn, showing that they have undergone but little rolling. There are also many rude flakes and roughly-chipped flints in this gravel, the human origin of which might be doubted if they were found alone; and occasionally deeply-stained primitive forms are met with, similar to those found by Mr. B. Harrison on the high plateau near Ightham. Several roughly-chipped flints and two very perfect implements were found by us on our recent visits to the pit. (See fig. 2, p. 523.)

So far as I have been able to ascertain, no mammalian remains have hitherto been obtained at Galley Hill itself; but Mr. Frank Corner possesses a *Hippopotamus*-tusk found at Milton Street by Mr. W. H. Smith, of Canning Town, who says that the tooth was obtained in 1889 at about 6 feet from the surface, in the brick-earth which overlaps the coarser gravel. Mr. Elliott has a deer's antler from the same place and some unrolled footbones of *Felis leo* from brick-earth, occupying a similar position at a high level, in a pit near Swanscombe.

Mr. F. C. J. Spurrell, of Belvedere, has found *Elephas primigenius*, *Rhinoceros* sp., *Bos*, *Equus*, and *Cervus* in the small patch of gravel near Northfleet Station; also these same species in the similar terrace-gravel at Dartford Brent, west of the City Asylum, besides other remains at intermediate localities. Mr. Spurrell's specimens were all found at the base of the gravel near the Chalk, and were in a much decayed condition. Speaking of the last-named locality, Mr. Spurrell says (*in lit.*):—'The lower layers still contained a large quantity of fine chalk, besides which the sand there had a large quantity of Woolwich-bed shells washed out clean; together these helped to protect the more recent shells from complete dissolution, and to preserve the only freshwater shells that I have seen in this

[1] Quart. Journ. Geol. Soc. vol. xlvii. (1891) p. 129.

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gravel—namely, *Cyrena fluminalis*, *Bithynia tentaculata*, *Valvata piscinalis*, and *Pisidium fontinale*.'

No one is better acquainted with the North Kent Pleistocene deposits than Mr. Spurrell, and he agrees with other writers in regarding these gravels, which extend from Dartford Heath to Gravesend, at a height of about 100 feet O.D., as parts of one original stretch of deposits, and the gravel now standing in the Galley Hill pit he believes to be an undisturbed portion of the same deposit.

Mr. Spurrell tells me that human bones have previously been met with, ostensibly from these gravels, but no record has been kept of the conditions under which they occurred. He doubts whether the human bones described in this paper are really of the same age as the gravels.

The fact that the surfaces of the Galley Hill bones have been eaten away by rootlets has led to the inference that the gravel in which they were found had been disturbed, for it has been thought that rootlets would not penetrate this terrace-gravel to so great a depth as 8 feet when it was in an undisturbed condition. However, on the occasion of one of our later visits to Galley Hill Mr. Elliott and Mr. Frank Corner traced living roots descending from the surface-soil through about 8 feet of undisturbed gravel down to the same level as that where the human bones were found, and within a few feet of the same spot. Also at Wanstead, in Essex, we have obtained roots from a depth of 7 feet below very similar gravel, containing Palæolithic implements, the undisturbed condition of which could not be doubted.

No one would, I think, question the Palæolithic age of this gravel at Galley Hill and in the neighbourhood, or the genuineness of the implements found in it, but for the finding of the human bones; this discovery, however, at once causes all manner of doubts to arise and renders it necessary to test every possibility of error. It may be thought that this northern edge of the sheet of gravel has been re-deposited by washing downhill towards the Thames; but this idea is not supported by an examination of the gravel now in place. Thus, although there is a thinning of the beds to the east and west (and doubtless also to the north, before the excavation of the pit), the bedding of the gravel and sand still to be seen in the section led Mr. Topley, Mr. Clement Reid, and Mr. Spurrell to the conclusion that this part of the gravel is undisturbed. It may be thought that this skeleton was let down from the surface in a more recently formed 'pot-hole,' but although such excavations are numerous in the adjacent Chalk, yet immediately below the spot where the bones were found (and the chalk still remains) there is no 'pot-hole.'

The possibility of these human bones being the remnants of a comparatively modern burial will occur to every one, but the peculiar characters presented by these remains point to their being of considerable antiquity, and the depth at which they were found—namely, below about 8 feet of gravel—is greater than in the case of most prehistoric interments. Moreover, there is no evidence

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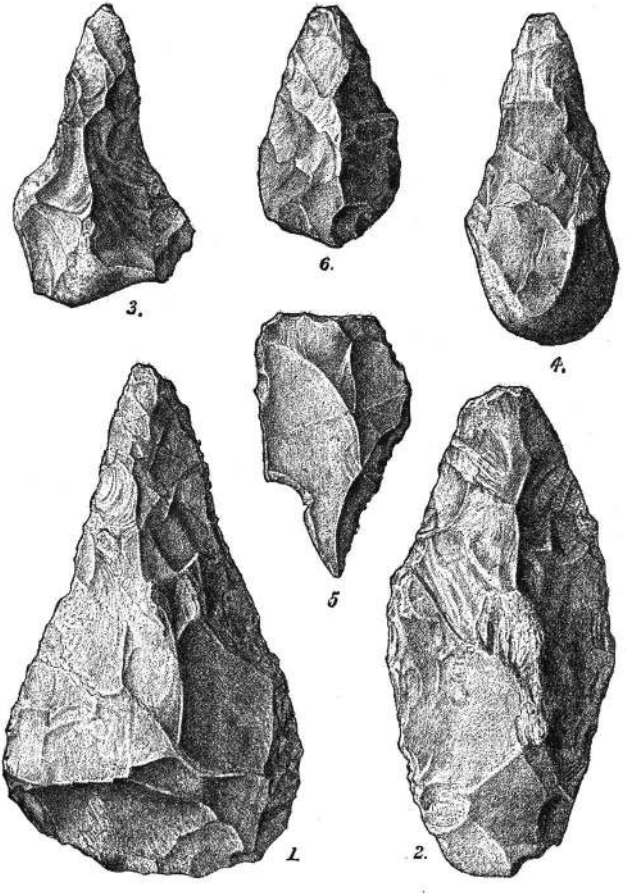
Fig. 2.—*Palæolithic Flint-implements from the Terrace-gravel at Galley Hill, Kent.*



Nos. 1 and 2 are chipped all round; 3 and 4 have a large portion of the original rounded surface of the flint left at the base; 5 is a flake worked on one side only; 6 is worked all round, except a small surface at the base. Specimens 1 to 5 were obtained by Mr. R. Elliott. No. 6 was found by the present writer in the gravel, during a recent visit.

(All the figures are half natural size.)

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whatever of this being an interment; and the two observers who saw the bones *in situ* are perfectly satisfied that the remains were deposited with the gravel and not as a subsequent burial.

The rarity of bones in these high-level gravels suggests the possibility of their having been removed by the continued percolation of water during the long period which has elapsed since they were deposited. It still further suggests that, if any human bones had been deposited with the gravel in Palæolithic times, they would long since have disappeared. However, bones of certain extinct mammals, *Elephas*, *Rhinoceros*, *Hippopotamus*, and *Felis leo*, have occasionally been found, although generally in a much decayed condition, and the circumstances, sufficiently favourable for their preservation, may have obtained in other places also. Indeed it is clear from Mr. Elliott's letter, and from my own observation in the pit, that patches of more clayey deposit do here and there occur, one such having been noticed very near where the skeleton was found.

The statements made by Mr. Elliott and Mr. Heys as to the undisturbed condition of the gravel above the skeleton, when it was first found, and which they saw *in situ*, are the most important pieces of evidence, as to the age of the remains, which it is now possible to obtain; and it is much to be regretted that the observations of these gentlemen were not at the time confirmed by some geologist experienced in the study of Pleistocene deposits.

Impressed with the desirability of this discovery being permanently recorded, and feeling that the interest of it will depend upon the establishment of the geological age of the remains, I have ventured to bring this paper before the Geological Society, where the points at issue will be best understood and most freely criticized; but, if Mr. Elliott's and Mr. Heys's observations are correct, there can be little doubt as to the Palæolithic age of these human remains from Galley Hill.

EXPLANATION OF PLATE XVI.

Human Remains discovered by Mr. Robert Elliott, in the High Terrace-gravel at Galley Hill, near Northfleet, Kent.

Fig. 1. Skull, side view (*norma lateralis*), with right half of mandible placed in position. Half natural size. The dotted lines show the probable position of the missing facial bones.

2. Molar and premolar teeth, grinding surfaces. Natural size.

3. Skull from above (*norma verticalis*). A series of dots indicate as nearly as possible the middle line, and show the torsion undergone in drying. Half natural size.

4. Skull from front (*norma frontalis*). Half natural size.

5. Skull from behind (*norma occipitalis*). Half natural size.

6. Left femur, front view, with outline of transverse section. One-fourth natural size.

7. Left femur, inner aspect. This bone is really much more denuded than it appears to be in these figures.

8. Right tibia, much broken; seen from front, with outline of transverse section. One-fourth natural size.

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Discussion.

Mr. Elliott said that the whole of the particulars appertaining to his discovery were embodied in his letter to the Author, and there was therefore very little to add. When he made the discovery he closely examined that portion of the pit in which part of the remains were still lying *in situ*, and felt certain that the gravel above them was undisturbed. There was one matter to which he wished to refer, and that was the reason why he had left the remains so long before bringing them to the notice of the Society. He had a desire to describe them himself; but, finding this impossible, he had decided to place the remains in the hands of Mr. E. T. Newton.

Mr. Heys said that the letter read by the Author contained the facts, so far as he had been able to ascertain them. He had seen the skull *in situ*, and was struck with the depth below the surface at which it lay, and by the natural stratification of the gravel in close contact with it. He had left the skull in place, in order that he might obtain corroborative evidence, or have it photographed; but to his great annoyance it had been removed by the workman when he again visited the spot.

Sir John Evans expressed his high appreciation of the great care and wealth of detail that Mr. Newton's paper exhibited. It seemed to him that the communication might be divided into two absolutely distinct sections—the one anthropological, the other geological. It was on the latter branch of the subject only that he proposed to say a few words. There could be, he thought, no doubt of the deposits at and near Swanscombe being true Pleistocene high-level gravels of the valley of the Thames; and the abundance of Palæolithic implements that occurred in them seemed to place their age beyond all doubt. With regard to the human remains, the real question at issue was whether they were deposited where found with the other constituent parts of the gravel, or not. It was unfortunate that so long a period had elapsed between the discovery of the bones and the attention of geologists being called to it. The evidence, however, of the undisturbed character of the beds seemed fairly strong, though, so far as he had understood the paper, one witness described the bones as having been found in gravel and the other in loam. Perhaps, however, both might mean the same deposit. The fact that the remains were found, not at the base of the gravels, like other bones from the same locality, but some few feet above the Chalk, was noteworthy; but what weighed most with him, and led him to doubt whether the bones were of the same age as the gravels, was the fact that nearly the whole skeleton, including the lower jaw and clavicle, had been preserved. Although occasionally in brick-earth the bones of a limb might have been found together, it might be regarded as almost if not quite universally the case that in gravels isolated bones only were found. The occurrence of a nearly perfect skeleton was suggestive of an interment; and the accumulation of surface-soil above the gravel might give the grave in which the body

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was deposited an appearance of having been of greater depth than it actually was. On the whole, he ventured to maintain an attitude of doubt, and would await further evidence before absolutely accepting these human remains, however ancient, as being of necessity contemporaneous with the beds in which they were found.

Prof. Boyd Dawkins congratulated the Author on the manner in which he had placed this discovery before the Society. He accepted the views of Sir John Evans with regard to the absence of distinct proof that the skeleton really belonged to the same age as the Palæolithic gravels. In his opinion the skeleton was probably the result of interment in the Palæolithic gravels at a later time. He regretted that the skull had not been compared with Scandinavian Long Barrow skulls. The race to which the skeleton belongs was an open question, and the geological age was also not clearly proved. They may safely be placed to a suspense account.

Dr. Garson said that in his opinion the special characters shown by this Galley Hill skeleton were:—the short stature, the very dolichocephalic skull, the prominent glabella and supraciliary ridges and the well-marked ridges of the skull generally, the absence of prominence of chin, and the large size of the last lower molar tooth, which was as large as, if not larger than, the first molar. The large size of the head of the femur was also peculiar. He did not think that the specimen showed any signs of pathological conditions being present. Nor did he consider that this was a modern skeleton, neither could he refer it to the Bronze or Round Barrow races. Although the dolichocephalic skull and short stature agreed with the Neolithic race, yet the prominent brow-ridges were quite unlike. Moreover, the last lower molar in the Neolithic skull was smaller than those in front of it. Accepting the Spy, Neanderthal, and Naulette specimens as representatives of the Palæolithic race, he was inclined to think that the Galley Hill skeleton was most nearly related to that race. The long form of the skull from Galley Hill, when seen from above, did not agree with the Continental forms, and it would be necessary to compare many skulls of the race in order to determine whether this was more than an individual variation.

Mr. W. J. Lewis Abbott pointed out that bones of the same animal had often been found in juxtaposition. On one occasion he had found at West Thurrock the greater part of a mammoth in gravel, overlain by an intercalated sheet of clay. He had worked the Galley Hill section, and had obtained from it numerous implements and flakes, some of which were so sharp as to suggest their having been made on the actual spot. He had noticed here and there thin lenticular patches of very tough clay. It was in all probability under a sheet of such impervious material as this that the human remains had been preserved.

Mr. J. Allen Brown congratulated the Society on the production before it of the best authenticated record of the occurrence of human remains in the higher river-drift that had yet been brought forward in England. As to placing this discovery to a suspense account, although great caution was necessary, he must add that they could

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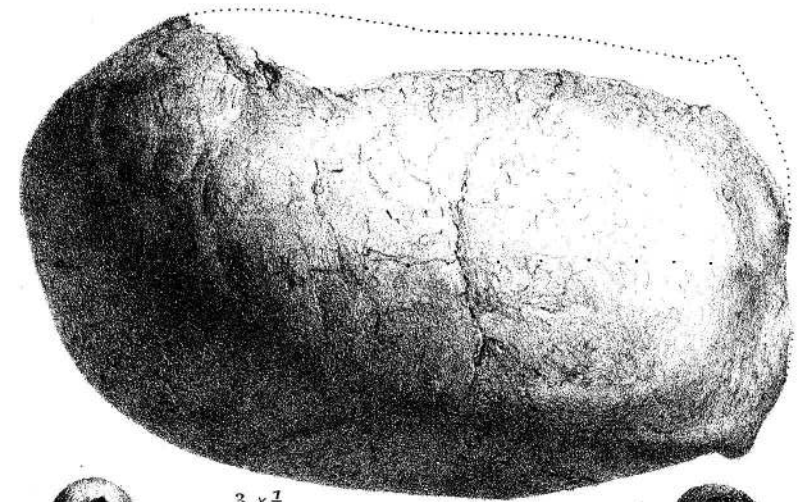
hardly expect to obtain a much better attested instance than in the one before the meeting; the silty clay-bed in which the fossils appear to have been found was just the kind of deposit in which bones were commonly met with in river-drift, and they probably owed their preservation to the deposit being less permeable than the gravel above them. With regard to the skull, the river-drift period was of such long duration that there was time enough for the migration of many races of men into this country, and there was every probability that different types of Palæolithic people lived at the same time in N.W. Europe. As a believer in the continuity of man's existence there from the Palæolithic to the Neolithic period, it was not surprising to him to find a skull in the drift which showed affinities both with some of the Palæolithic skulls and those of the early Neolithic period as in the specimen before them.

Prof. Sollas regretted that the evidence for the absence of interment was not more perfect. Mr. Heys had only seen the skull in position for a few minutes, but Mr. Elliott's evidence was less open to question. The anatomical characters, as described by Mr. Newton, seemed, however, to show that the skull belonged to the same type as the Neanderthal and Spy skulls, the latter of which was clearly Palæolithic; it was hence highly probable that the Galley Hill specimen, which occurred along with Palæolithic implements, was in a natural position and had not been interred.

The Author, in reply, thanked the speakers for their kind criticisms. The object of the discussion was to elicit truth and eliminate error. In the present instance, he believed that the chain of evidence of the Palæolithic age of the remains was complete; although some of the links were not so strongly wrought as could be wished.



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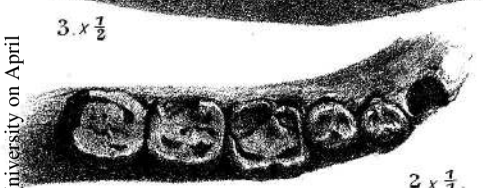

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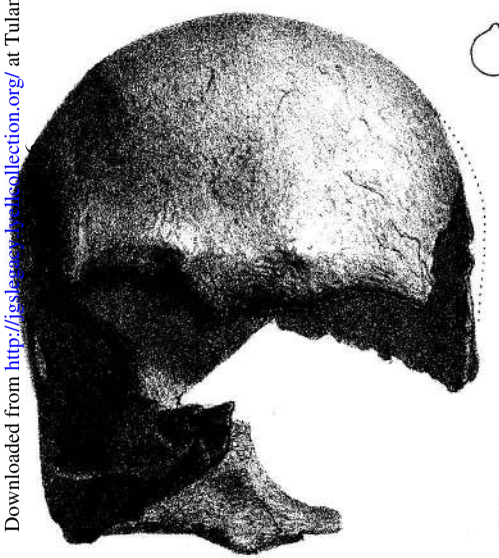

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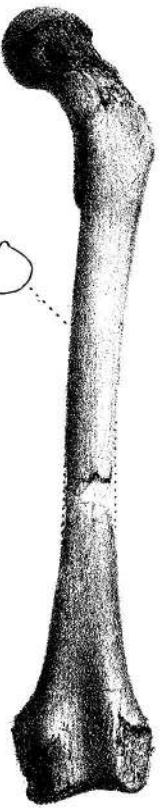

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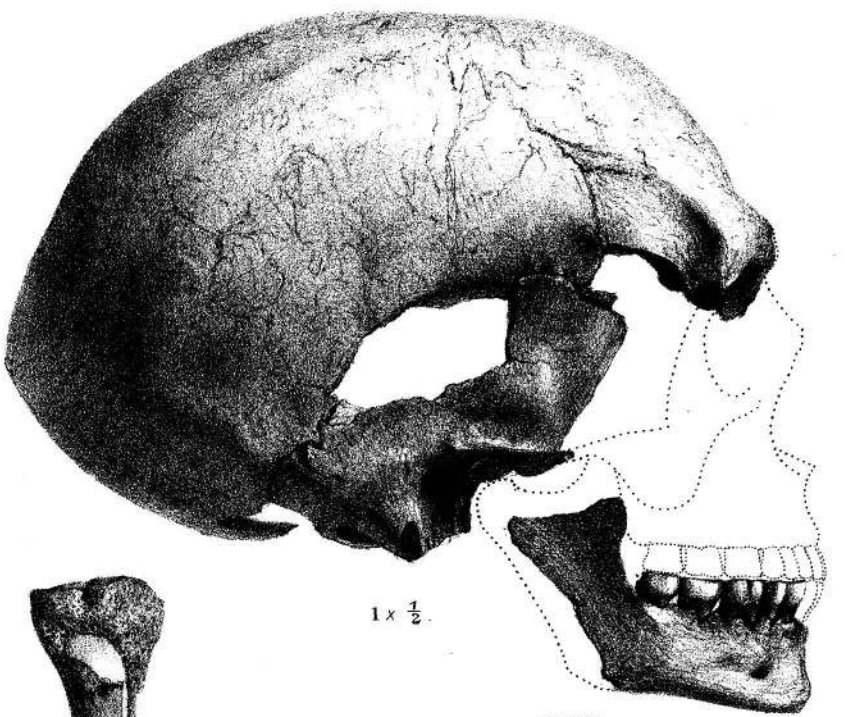

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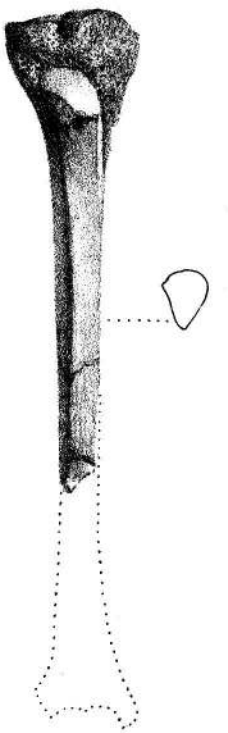

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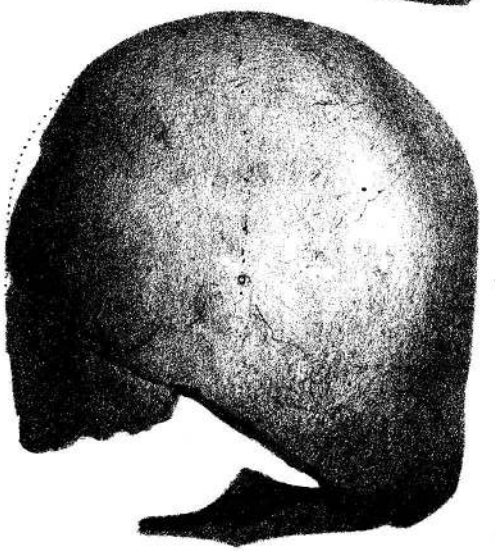

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F. H. Michael del. et lith.

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HUMAN REMAINS FROM TERRACE-GRAVEL, GALLEY HILL, KENT.